THIRD FIVE-YEAR REVIEW REPORT

Avtex Fibers Superfund Site
Front Royal, Warren County, Virginia

Prepared by:

U.S. Environmental Protection Agency

Region III

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U.S. EPA, Region 3

Date:

3/26/08

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Attachments

List of Acronyms

ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
EDA	Economic Development Authority
EPA	Environmental Protection Agency
NCP	National Contingency Plan
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NTCRA	Non-Time-Critical Removal Action
O&M	Operation and Maintenance
OSC	On-Scene Coordinator
OU	Operable Unit
PPA	Prospective Purchaser Agreement
PCB	Polychlorinated Biphenyls
ppm	parts per million
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
SARA	Superfund Amendments and Reauthorization Act
TSCA	Toxic Substances Control Act

List of Acronyms, cont'd

UAO	Unilateral Administrative Order
VDEQ	Virginia Department of Environmental Quality
WWTP	Wastewater Treatment Plant

Executive Summary

Since the plant's shutdown in November 1989, EPA implemented several response actions at the abandoned Avtex Fibers Superfund Site in Front Royal, Virginia. On September 28, 1990, EPA signed the Record of Decision (ROD), referred to as ROD 2, to continue to stabilize conditions at the Avtex Site. ROD 2 required four discrete actions which have been designated as separate Operable Units (OUs) to facilitate project management and cleanup. The actions included in that ROD 2 were excavation and off-site disposal of PCB-contaminated soil (OU-2), dismantling and demolition of acid reclaim buildings (OU-3), performing site security, maintenance and control (OU-4), and sampling and off-site disposal of drummed waste (OU-5). These response actions for OU-2, OU-3, OU-4, OU-5 have been completed. However, the response actions associated with OU-3, OU-4, and OU-5 did not leave wastes on Site and, therefore, are not subject to this five-year review.

EPA selected a remedy for OU-8 requiring institutional controls which permanently restrict the land use of Areas B and C to commercial/light industrial use on September 29, 2000. At present an institutional control is in place for the entire Avtex Site. A Conservation and Environmental Protection Easement and Declaration of Restrictive Covenants (Conservation Easement) was filed on December 7, 1999, which restricts land use of the areas associated with OU-8 to commercial/light industrial and meets the remedial objective specified in the ROD.

In addition, EPA selected a remedial action in the March 10, 2004 OU-10 ROD for Viscose Basins 1 through 8, the New Landfill and Plant Area Soils. The selected remedy for Viscose Basins 1 through 8 includes improving the existing soil covers, collecting and treating leachate and groundwater monitoring. The selected remedy for the New Landfill includes constructing a soil cap, collecting and treating leachate and ground water monitoring. The final area included in the OU-10 ROD is the Plant Area Soils. The selected remedial action requires cleanup of Plant Area Soils to levels that protect human health and the environment. On January 10, 2006, EPA issued an Explanation of Significant Differences (ESD) to extend the area to be remediated as part of Plant Area Soils.

The assessment of this five-year review found that the remedies for OU-2 and OU-8 were implemented in accordance with their respective RODs and are considered protective of human health and the environment. OU-10 construction is in progress and the remedy is expected to be protective upon completion. The other response actions, including the Time-Critical Removal Action Buildings, the Non-Time-Critical Removal Action - Basins, the Non-Time-Critical Removal Action - Buildings and Sewers, and wastewater treatment, are in progress and are expected to be protective upon completion.

One final ROD is anticipated for this Site. Based on the findings of the RI/FS that is underway, a ROD will be issued for OU-7.

Because the Site is not construction complete, a Site-wide protectiveness determination has not been made.

This is the third five-year review for the Site. The first review was triggered by the date that onsite construction began for OU-2 and OU-3. The trigger for this five-year review was the completion date of the second review, March 28, 2003.

Five-Year Review Summary Form

Site Identification		
Avtex Fibers Superfund Site		
EPA ID: VAD0070358684		
Region: 3	State: VA	City/County: Front Royal/Warren County
Site Status		
NPL status : * Final Deleted Other (specify)		
Remediation status: * Under Construction * Operating Complete OU-2, OU-3, OU-4 & OU5 - Complete Time-Critical Removal Action (Buildings): under construction Non-Time-Critical Removal Action (Buildings): under construction Non-Time-Critical Removal Action (Basins): under construction OU-10: under construction (plant area soils); in design (Viscose Basins 1-8 and the New Landfill) OU-7: FS underway		
Multiple OUs? * Yes No	Construction Completion date: N/A	
Has Site been put into reuse? Yes * No		
Review Status		
Lead Agency: * EPA State Tribe Other Federal Agency		
Author name: Bonnie Gross		
Author title: Remedial Project Manager	Author affiliation: US EPA, Region 3	
Review period: 01/21/2008 to 03/12/2008		
Date of Site inspection: 01/23/2008		
Type of review: * Post-SARA Pre-SARA NPL-Removal only Non-NPL Remedial Action Site NPL State/Tribe-lead Regional Discretion		
Review number : 1 (first) 2(second) *3 (third) Other (specify)		
Triggering action: Actual RA Onsite Construction Actual RA Start at OU#__ Construction Completion * Previous Five-Year Review Report Other (specify)		
Triggering action date: 03/28/2003		
Due date (five years after triggering action date): 03/28/2008		

Five-Year Review Summary Form, cont'd

Issues:

No new issues have been identified as a result of this five-year review.

Recommendations:

There are no new recommendations or specific follow-up actions required.

Protectiveness Statement:

The remedies for OU-2 and OU-8 are considered protective of human health and the environment as intended by their RODs.

In regard to OU-10, construction is in progress for Plant Area Soils and the design for Viscose Basins 1 through 8, and the New Landfill was approved in January 2008. The RI/FS for OU-7 is in progress. Future five-year reviews will evaluate the protectiveness of the response actions of those Operable Units, as appropriate.

The other response actions, including the Time-Critical Removal Action Buildings, the Non-Time-Critical Removal Action - Basins, the Non-Time-Critical Removal Action - Buildings and Sewers, and wastewater treatment, are in progress and are expected to be protective upon completion.

One final ROD is anticipated for this Site. Based on the findings of the RI/FS that is underway, a ROD will be issued for OU-7.

Because the Site is not construction complete, a Site-wide protectiveness determination has not been made.

U.S. Environmental Protection Agency
Region III
Hazardous Site Cleanup Division
Second Five-Year Review
Avtex Fibers Superfund Site
(EPA # ID VAD0070358684)
Front Royal, Warren County, Virginia

I. Introduction

The purpose of the five-year review is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings and conclusions of the review are documented in a Five-Year Review report. In addition, a Five-Year Review report identifies issues, if any, found during the review and identifies recommendations to address them. This document will become a part of the Site file and the Administrative Record file for the Site.

The Agency is preparing this Five-Year Review report pursuant to CERCLA §121 and the National Contingency Plan (NCP). CERCLA §121 states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgement of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

The Agency interpreted this requirement further in the NCP; 40 CFR § 300.430(f)(4)(ii) states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

The United States Environmental Protection Agency (EPA), Region 3, conducted this five-year review of the remedy implemented at the Avtex Fibers Superfund Site in Front Royal, Virginia. This review was conducted for the entire Site by the Remedial Project Manager (RPM) from January 2008 though March 2008. This report documents the results of the review.

This is the third five-year review for the Avtex Fibers Superfund Site. The triggering action for this review is the second five-year review report signed March 28, 2003. The initial five-year review was required in conjunction with Operable Unit 2 (OU-2) of the September 1990 Record of Decision (ROD 2) due to the fact that hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure.

II. Site Chronology

A comprehensive list of Site events highlighting removal, remedial and enforcement activities are provided in Table 1 below.

Table 1: Chronology of Site Events

Date	**Event**
October 15, 1984	Proposed to NPL List
June 10, 1986	Final NPL Listing
August 11,1986	EPA entered into a Consent Order with Avtex Fibers to perform Remedial Investigation and Feasibility Study (RI/FS) to investigate the impacts of the viscose basins on the groundwater.
January 6, 1988	EPA amends the Consent Order to include FMC Corporation (FMC) as a potentially responsible party.
September 30, 1988	ROD 1 selecting the Operable Unit 1 (OU-1) remedy to pump and treat contaminated ground water using existing pumping wells is signed.
May 12, 1989	Virginia Department of Health issued advisory against fish consumption in certain portions of the Shenandoah River. The South Fork of the Shenandoah River adjacent to the Avtex Site was part of that advisory.
June 30, 1989	EPA issues a Unilateral Administrative Order (UAO) to Avtex and FMC to implement the remedial action chosen in the ROD 1 for OU-1.
September 20, 1989	EPA Region III receives request from Virginia Department of Waste Management to conduct a removal assessment.
September 26, 1989	EPA On-Scene Coordinator (OSC) initiates a removal assessment at Avtex.

Date	Event
October 31, 1989	EPA issued a UAO to Avtex ordering it to conduct a removal action at the Site. Actions required include a plan to sample and segregate and dispose of hazardous substances, including drummed wastes and a plan to evaluate certain polychlorinated biphenyls (PCBs) - contaminated areas and a plan to provide Site security among other things.
November 10, 1989	Avtex Fibers National Pollutant Discharge Elimination System (NPDES) permit revoked by the Virginia Water Control Board. Avtex ceased operations.
November 11, 1989 - September 30, 1993	EPA initiated an emergency removal action at the Site. Removal operations included an imminent hazard evaluation; establishing Site security; design and operation of the wastewater treatment system; return of raw chemicals to suppliers; disposal of lab pack and flammable chemicals, draining and treatment of 22 carbon disulfide impoundments; and draining, flushing, and onsite treatment of various process line, tank and vessel fluids.
November 29, 1989	EPA issued a UAO to Avtex which restricts access to the Site and prohibits interference with EPA's removal actions being conducted at the Site.
February 2, 1990	EPA issued a UAO (WWTP UAO) ordering FMC to operate the wastewater treatment plant (WWTP) at the Site in order to maintain freeboard levels in sulfate basins 1-4E and the emergency lagoon.
February 6, 1990	Avtex Fibers, Inc. and Avtex Fibers - Front Royal file for Chapter XI Bankruptcy.
August 14, 1990	Proposed Plan identifying EPA's preferred remedy for OU-2 (Complete Site Stabilization Activities) presented to public; start of public comment period.
September 28, 1990	ROD 2 selecting the OU-2 remedy is signed. Subsequent to the OU-2 ROD, operable units for the Site were redefined to facilitate project management, Site characterization and remedial action. Remedial action defined in ROD 2 were designated as: OU-2 PCB contaminated soils; OU-3 demolition of the acid reclaim facility; OU-4 Site security; and OU-5 drum removal.
March 4, 1991	Remedial Action for OU-3 delivery order was issued to commence expedited remedial actions for the acid reclaim facility.

Date	Event
March 4, 1991	Remedial Action for OU-2 delivery order was issued to commence PCB soil cleanup.
July 22, 1991	Remedial Action for OU-4 to provide Site security and maintenance initiated.
October 22, 1991	EPA issued a UAO requiring FMC to provide alternate water to residents in Rivermont Acres, a residential subdivision on the west side of the Shenandoah River.
January 22, 1992	OU-2 PCB soil cleanup completed.
March 30, 1993	EPA and FMC signed a Consent Order which required FMC to complete a portion of the RI/FS for the viscose basins, sulfate basins, WWTP lagoons, fly ash piles and basins, groundwater and onsite soils. The balance of the RI/FS, which included the investigation of the buildings, sewers, the River, an ecological investigation and risk assessment, would be conducted by EPA.
August 2, 1993	EPA issued Modification 1 to the WWTP UAO allowing FMC to decrease freeboard in the sulfate basins for the purpose of conducting sampling of the sulfate basins during the RI field work.
September 23, 1993	OU-3 Remedial Action Report for the Acid Reclaim dismantling and demolition completed.
October 1, 1993 - September 29, 1995	EPA continued time-critical removal activities including decommissioning of 22 carbon disulfide impoundments onsite; draining, treating and/or disposal of liquid wastes from 7 large storage tanks, removing and disposing of zinc sludge; directing and overseeing cleanup of PCB-oil spill conducted by Bankrutpcy Trustee hired contractor; overseeing removal and decontamination of assets sold by Bankruptcy Trustee.
September 20, 1996 - September 1998	Based upon the results of a EPA's remedial investigation, a time-critical removal action focusing on the demolition of the rayon manufacturing process buildings and staging of demolition debris was conducted. A total of 5,720,000 gallons of water generated during the removal activities were treated and/or discharged to the onsite WWTP.
November 18, 1996	First five-year review completed.

Date	Event
October 8, 1998	EPA issued a second modification to the WWTP UAO ordering FMC to perform stabilization activities at the Site. The removal activities conducted included, among other things, erosion and sedimentation control, and management of waste piles and debris.
February 19, 1999	Pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA), the Prospective Purchaser Agreement (PPA) between EPA and Century Enterprises, LLC became effective. The PPA pertains to a 5.2 acre uncontaminated parcel of land.
February 1999	EPA completes Final Ecological Risk Assessment for the Site and the adjacent reach of the South Fork of the Shenandoah River.
February 1999/March 1999	EPA, FMC, and the Virginia Department of Environmental Quality (VDEQ), working with the local Economic Development Authority (EDA), formed a stakeholder group to provide public input on the cleanup and reuse of the Avtex Site. The group is composed of individuals and organizations who reflect the diverse interests of Front Royal and Warren County.
May 29, 1999	EPA issues a proposed non-time-critical removal action plan for closing the sulfate basins, the wastewater treatment plant basins, the fly ash basins and fly ash stockpile. The public comment period took place from May 29, 1999 through July 2, 1999 with a public meeting conducted on June 17, 1999.
July 9, 1999	The Consent Decree between FMC Corporation and EPA was lodged in the U.S. District Court of Western Pennsylvania pursuant to the Clean Water Act and the Oil Pollution Act of 1990. The Consent Decree identified and defined additional activities to be conducted at the Site. Additional time-critical response activities for buildings were defined. The Consent Decree provided that EPA would select a non-time-critical response action (NTCRA) for sulfate sludge and fly ash wastes and a non-time critical response action for buildings and sewers. The Consent Decree also requires FMC to implement the OU-7 remedy (Viscose Basins 9-11, groundwater and surface water), and the OU-10 remedy (Viscose Basins 1-8, the New Landfill, WWTP and soils) after EPA issues RODs for these two operable units.

Date	Event
October 21, 1999	The Consent Decree between FMC and EPA became effective. FMC provides Site security, control, maintenance, and health and safety measures to ensure protection of human health and the environment in accordance with the Consent Decree.
November 1999	Avtex Bankruptcy Plan of Reorganization effective. Industrial Development Authority of the Town of Front Royal and the County of Warren County, d/b/a the Economic Development Authority (EDA) take title to property.
December 7, 1999	The Conservation and Environmental Protection Easement (Conservation Easement), which permanently places enforceable limitations on the future land uses of the Avtex Fibers Superfund Site Property, filed. The Conservation Easement will be held and enforced by the Lord Fairfax Soil and Water Conservation District and the Valley Conservation Council.
January 31, 2000	EPA signed a Removal Action Memorandum selecting a non-time-critical response action for the sulfate basins, the wastewater treatment plant basins, the fly ash basins and the fly ash stockpile, a.k.a., non-time-critical-removal action - Basins (NTCRA - Basins).
March 20, 2000	The PPA between EPA and the EDA, the Town of Front Royal and the County of Warren became effective.
August 2, 2000	EPA issues proposed plan for OU- 8 which consists of Areas B and C. Public comment period took place from August 2, 2000 through September 1, 2000 with a public meeting conducted August 17, 2000.
September 29, 2000	ROD 3 for OU-8 selecting institutional controls which permanently restrict the land use of Areas B and C to commercial/light industrial usage is signed.
April 2001	EPA approves FMC's Response Action Plan to close the basins.
May 2001	FMC begins onsite work to close basins. FMC continues to implement the closure.
December 20, 2001	EPA signed a Removal Action Memorandum selecting a non-time-critical response action for the remaining buildings and sewers, a.k.a., non-time-critical-removal action - Buildings (NTCRA - Buildings).

Date	Event
January 2002	FMC began decontaminating the buildings under an approved Response Action Plan. Cleanup of the buildings is approximately 95% complete, with some subgrade foundations and structures remaining to be managed.
March 28, 2003	Second five-year review completed.
July 31, 2003	EPA issues the OU-10 proposed plan identifying EPA's preferred remedial action alternative for Viscose Basins 1 through 8, the New Landfill, and the Plant Area Soils. Public comment period took place from July 31, 2003 through August 30, 2003 with a public meeting conducted August 14, 2003.
March 10, 2004	EPA signs ROD 4 for OU-10 selecting for Viscose Basins 1 through 8, the New Landfill and Plant Area Soils. The selected remedy for Viscose Basins 1 through 8 includes improving the existing soil covers, collecting and treating leachate and groundwater monitoring. The selected remedy for the New Landfill includes constructing a soil cap, collecting and treating leachate and ground water monitoring. The final area included in the OU-10 ROD is the Plant Area Soils. The selected remedial action requires cleanup of Plant Area Soils to levels that protect human health and the environment.
December 23, 2004	EPA approved the OU-10 Remedial Design Work Plan for Viscose Basins 1 through 8 and the New Landfill.
April 8, 2005	EPA approved the OU-10 Remedial Design Work Plan for Plant Area Soils.
June 13, 2005	As part of the NTCRA - Buildings project, FMC began excavating sewers under an approved Response Action Plan. The project is being conducted in three phases as buildings and other obstacles to sewer excavation have been removed. Phase I sewer removal activities were completed in Fall 2005.

Date	Event
September 19, 2005	The U.S. Army Corps of Engineers, Norfolk District (USACE), imploded the boiler house, part of a massive three-building complex that included the power house and compressor room. After the boiler house implosion, USACE contractors demolished the remaining two buildings using conventional track hoe methods. This milestone was marked with a well-attended ceremony including speakers: Congressman Frank Wolf, Front Royal Mayor James M. Eastham; Norfolk District Commander and Engineer, Col. Yvonne J. Prettyman-Beck; U.S. EPA Region III, Regional Administrator, Donald S. Welsh; and FMC Corporation Senior Vice President W. Kim Foster.
January 10, 2006	EPA signed an ESD for OU-10 ROD to expand the area being addressed as Plant Area Soils to include additional areas of concern that had been identified.(Soils in Vicinity of SoccerPlex Area, Burnt Debris/Ash Area, and the Coal Seam Area).
August 17, 2006	EPA approved the final Viscose Basin Leachate Pumping Test and Field Treatability Study Work Plan. FMC conducted the work during July and August 2006 to provide additional information for the preparation of the OU-7 Feasibility Study Report.
September 9, 2006	The Skyline Soccerplex, the first completed redevelopment of the Site, officially opened. FMC, EPA, the U.S. Soccer Foundation, and the local EDA worked together to clean up the 30-acre parcel of land and construct four soccer fields.
September 29, 2006	EPA provided conditional approval of FMC's Time-Critical Removal Action Buildings Report dated September 28, 2006. This Report documents the work activities conducted and completed in accordance with Paragraph 21 of the October 21, 1999 Consent Decree describes the work to be conducted and completed by FMC for the Removal Action – Buildings (Time-Critical). Conditional approval was provided because a number of the required activities described by these documents are currently being implemented along with the Non-Time-Critical Removal Action - Buildings as part of the remaining buildings and the remaining sewers remedies, and the Record of Decision for Operable Unit 10 as part of the Plant Area Soils remedy.
September 29, 2006	EPA approves the OU-10 Final Remedial Design for Plant Area Soils.

Date	Event
February 26, 2007	As part of the NTCRA - Buildings project, FMC initiated Phase II of the removal of sewers. Sewer removal is ongoing and is about 50% completed; with more than 27,000 feet of sewers excavated to date during Phases I and II.
May 31, 2007	Reconciliation and Termination Agreement to the State Superfund Contract for Remedial Actions between the Virginia Department of Environmental Quality and EPA is executed.
November 2007	USACE completed non-CERCLA asbestos abatement and building demolition activities and demobilized from the Site.
November 5, 2007	EPA approves FMC's Plant Area Soils Remedial Design Amendment #1 to the approved Final Remedial Design for Plant Area Soils (OU-10). This amendment updated the remedial design to include soils that had been characterized since the September 29, 2006 final remedial design.
December 10, 2007	EPA approves FMC Plant Area Soils Remedial Design Amendment #2 to the approved Final Remedial Design for Plant Area Soils (OU-10). This amendment updated the remedial design to include soils that had been characterized since the first amendment to the remedial design (November 5, 2007).
January 22, 2008	EPA approves FMC's Final Remedial Design for Viscose Basins 1-8 and New Landfill (OU-10).

III. Background

Site Description

The Avtex Fibers, Inc. Site (Site) is a former synthetic fibers manufacturing facility that is located at 1169 Kendrick Lane, Front Royal, Virginia. Over the course of approximately 50 years, the plant manufactured rayon, polyester and polypropylene. Situated along the east bank of the South Fork of the Shenandoah River (River), the facility occupies approximately 440 acres. A map of the Site is provided in Attachment 1.

The Site property is bisected by the Norfolk Southern Railway Company railroad (the Norfolk Southern) which separates the plant production area from the former waste disposal areas. The plant area occupies approximately 200 acres east of the railroad tracks whose features included approximately 60 acres of manufacturing and administrative buildings, tank storage areas, open fields and parking lots. The area west of the railroad tracks, encompassing approximately 240 acres, includes 23 impoundments and fill areas, and a wastewater treatment plant (WWTP). A ground water plume from the impoundment area extends under the River and beneath some property on the west bank of the South Fork of the River (Rivermont Acres).

To manage the evaluation and cleanup more efficiently, ten operable units have been designated for the Site. For information purposes, a summary of the operable units is provided below:

- Operable Unit One (OU-1) addressed ground water contamination caused by fluids leaking from Viscose Basins 9, 10 and 11, but implementation of this remedial action was suspended by EPA. This groundwater investigation is now being addressed as part of OU-7;

- Operable Unit Two (OU-2) is a remedial action to address PCB-contaminated soils above 10 parts per million (ppm) by excavation and off-site disposal. This remedial action was completed by EPA in January 1992;

- Operable Unit Three (OU-3) is a remedial action to address the unstable acid reclaim buildings. The dismantling and demolition of the acid reclaim buildings was completed by EPA in September 1993;

- Operable Unit Four (OU-4) is a remedial action that addressed the need for Site security to protect workers and trespassers from the physical, chemical and structural threats present at the Site. This remedial action was completed by EPA in September 2002;

- Operable Unit 5 (OU-5) addressed the sampling, identification and disposal of drums of hazardous substances. This remedial action was completed by EPA in September 1994;

- Operable Unit 6 (OU-6) encompassed the investigation of onsite buildings. This remedial investigation led to EPA's time-critical removal action to demolish high hazard process buildings in September 1997. In September 1998, FMC assumed the responsibility to manage all the demolition debris and waste materials. The response action is nearly complete.

- Operable Unit 7 (OU-7) will involve remedial response actions necessary to address Viscose Basins 9, 10 and 11, ground water, and surface water.

- Operable Unit (OU-8) consists of Areas B and C. EPA signed a ROD (ROD 3) on September 29, 2000 selecting institutional controls which permanently restrict the land use of Areas B and C to commercial/light industrial. The requirements of this ROD are being implemented through the Conservation Easement. An operable unit completion report needs to be prepared.

- Operable Unit 9 (OU-9) consists of the ecological investigation and risk assessment. Based on the results of this investigation and assessment, a non-time-critical-removal action is being performed to close the sulfate basins, fly ash

basins and stockpile and the wastewater treatment plant basins. No further work under this operable unit is planned.

- Operable Unit 10 (OU-10) consists of plant area soils, Viscose Basins 1 through 8, and the New Landfill. EPA signed a ROD (ROD 4) for OU-10 on March 10, 2004. The selected remedy for Viscose Basins 1 through 8 includes improving the existing soil covers, collecting and treating leachate and groundwater monitoring. The existing on-site WWTP may be used to treat the leachate. When it is no longer required to treat stormwater and leachate, the on-site WWTP will be decontaminated and demolished. The selected remedy for the New Landfill includes constructing a soil cap, collecting and treating leachate and ground water monitoring. The final area included in the OU-10 ROD is Plant Area Soils. The selected remedial action requires cleanup of Plant Area Soils to levels that protect human health and the environment.

Land Use

Both RODs 2 and 3 addressed areas associated with the plant portion of the property. Future land use associated with those areas was identified as commercial/light industrial. Since ROD 2 was issued in September 1990, future land use of the plant portion of the property has been further refined and land use for the disposal area defined.

In 1998, the Town and County officials, along with FMC, engaged Northern American Realty Advisory Services (NARAS) to prepare a comprehensive plan for the Site's redevelopment and reuse. An approved master plan emerged from that process that provided for the development of the Site into a mixed-use commercial, light industrial, office, and open space project. Since then, areas of reuse have been further refined to either commercial/light industrial (160 acres), active recreation (33 acres), conservancy and open space (240 acres), and public park on the west side of the South Fork of the Shenandoah River (70 acres). Enforceable limitations on the future land uses have been placed on the Avtex property. A Conservation Easement was filed on December 7, 1999 and is held and enforced by the Lord Fairfax Soil and Water Conservation District and the Valley Conservation Council.

The EDA holds title to the property and has the lead in its redevelopment. The working name of the commercial/light industrial redevelopment effort is Royal Phoenix. In 2005, the EDA development a redevelopment concept plan for the Royal Pheonix that included two economic pillars: hospitality and innovative technology. In October 2005, the EDA had selected a firm, Lerner Enterprises, to begin working on an agreement to purchase and develop the 160-acre business park. However, an agreement was never reached. The EDA is now re-evaluating it's plan for redeveloping the commercial/light industrial area.

Land use surrounding the Site consists of a private school located along the eastern property boundary, residential areas located to the east, south and north property boundaries. In addition, the former General Chemical facility plant is located along the north/northwest boundary of the property. The projected land use for the former General Chemical plant is

conservancy/open space. The other land uses surrounding the Site are expected to remain the same.

Resource Use

Lateral groundwater flow through the overburden materials and bedrock is generally westward toward the River, where it discharges. At depth, the groundwater passes beneath the river. Data obtained during bedrock coring and geophysical borehole logging indicate that groundwater flow in the bedrock aquifer occurs along fractures, joints, and cleavage. The bedrock aquifer is used in the area west of the River for domestic water supply. Potable water in the area on the east side of the River is provided by the Town of Front Royal.

In 1982,carbon disulfide was detected in domestic wells in Rivermont Acres, across the River from the Avtex Site. The carbon disulfide plume passed beneath the river because of density differences between the plume of contamination and groundwater. Avtex purchased all the homes with domestic wells within the potentially degraded area of Rivermont Acres. In addition, FMC supplies water to four seasonal residences outside the known plume of contamination, but located in Rivermont Acres. Currently, the EDA holds title to the properties purchased by Avtex. Parcels of land that were not purchased in Rivermont Acres do not have wells.

The primary surface water feature at the Avtex Site is the South Fork of the Shenandoah River. Surface water from the Avtex Site generally drains west toward the river, which has historically received runoff and treated discharge from the WWTP at the Site. The South Fork of the Shenandoah River flows northeast to its confluence with the North Fork. The River is used recreationally for fishing and boating adjacent to the Avtex Site.

History of Contamination

For nearly 50 years, the Avtex plant manufactured rayon, polyester and polypropylene fibers for commercial, defense and space industries. It employed over 2,500 people in the area. From 1940 through 1962, American Viscose owned the facility. FMC Corporation (FMC) owned the plant from 1963 until 1976. In 1976, Avtex Fibers, Inc. (Avtex) purchased the Site from FMC and continued manufacturing operations until November 1989 when the plant closed and declared bankruptcy.

The plant manufacturing operations generated three major waste types. The first type was generated when the waste acid from the production process was treated with lime in the WWTP; the metal bearing sludge generated by that treatment was placed in six sulfate basins. The second waste type was the fly ash generated from the combustion of coal in the onsite power plant. Fly ash was disposed in four impoundments and one stockpile. The third waste type was waste viscose that was disposed in eleven onsite viscose basins. The waste viscose was primarily an off-specification product from the production process. In addition, solid wastes were placed in an onsite solid waste landfill that was permitted by Virginia.

Initial Response

The Site was proposed and subsequently finalized on the NPL in 1986 after ground water contamination was found in residential wells in Rivermont Acres across the River from the plant. Prior to its listing on the NPL, Avtex purchased all the homes with domestic wells within the potentially degraded area of Rivermont Acres. In addition, water was supplied to four residences outside the known plume of contamination, but located in Rivermont Acres.

Under the 1986 Consent Order with EPA, Avtex performed a remedial investigation which included installing monitoring wells and sampling ground water and waste materials. In September 1988, EPA issued ROD 1 for OU-1 specifying pump and onsite treatment of ground water and dewatering viscose basins 9, 10 and 11.

Shortly after EPA issued an Administrative Order requiring Avtex and FMC to implement the ROD 1 for OU-1, Virginia discovered significant PCB contamination. On July 14, 1989, Virginia filed a $19.7 million environmental damage suit against Avtex for violating its state pollution discharge permits.

At the request of the Virginia Department of Waste Management (now known as the Virginia Department of Environmental Quality), an EPA On-Scene Coordinator (OSC) performed a preliminary assessment of the Site in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) on September 26, 1989. The assessment confirmed the existence of a threat to public health, welfare, and the environment due to the release of polychlorinated biphenyls (PCBs), the threat of fire and explosion, and concerns associated with the integrity and management practices of the bulk storage tanks and process lines used to contain or transfer hazardous substances at the Site. One month later, on October 31, 1989, EPA issued a UAO to Avtex requiring the company to undertake PCB removal action at the Site.

On November 10, 1989, the State Water Control Board (SWCB) revoked the plant's National Pollutant Discharge Elimination System (NPDES) Permit. Subsequently, Avtex discontinued operating and abandoned the facility. EPA Region III responded under CERCLA declaring an emergency situation due to the uncontrolled nature of the Site resulting from the plant shutdown on November 11, 1989. Highlights of EPA's emergency and removal response activities include: transferring approximately 2,000 tons of various chemicals for recycle/reuse; onsite and off-site treatment of an estimated 241,000 gallons of flammable and corrosive chemicals; designing and operating a low-flow wastewater treatment system to protect the Shenandoah River from untreated discharges; closing 22 carbon disulfide impoundments which included treating approximately 992,000 gallons of carbon disulfide wastewater; treating and removing approximately 1,300 cubic yards of carbon disulfide sludge; and disposing of 320 cubic yards of contaminated soils. In addition, the contents of 33 large capacity storage tanks were drained. As part of this action, EPA managed over 770,000 gallons of hazardous and non-hazardous liquids and 320 cubic yards of soil.

Basis for Taking Action

A. ROD 1 - Operable Unit 1

The remedial investigation conducted by Avtex confirmed the presence of ground water contamination associated with Viscose Basins 9, 10 and 11. Elevated levels of carbon disulfide, phenol, cadmium, arsenic and pH in ground water were attributed to viscose waste in those basins. The risk assessment determined that future use of ground water as a potable water supply would result in unacceptable risk to human health.

B. ROD 2 - Operable Units 2, 3, 4 and 5

On November 11, 1989, EPA Region III declared an emergency situation because of the uncontrolled nature of the Site resulting from the shutdown. The EPA removal program took numerous actions to reduce risk and stabilize Site conditions. The OSC determined further actions were necessary and appropriate prior to beginning the RI/FS for the entire Site. Based on the OSC's recommendations, EPA issued ROD 2 in September 1990 which selected a cleanup plan to address discrete problems at the Site. Subsequently, the remedial actions covered by ROD 2 were broken down into four separate operable units, OU-2, OU-3, OU-4 and OU-5, discussed below.

1. ROD 2 - Operable Unit 2

In September 1989, the EPA OSC determined that an imminent threat to the health of workers existed from contact with PCB contaminated soils. In addition, an imminent threat to the environment existed from the discharge of PCB contaminated wastewater from the storm sewer to the Shenandoah River. EPA had issued an Administrative Order on October 31, 1989 requiring Avtex to a perform a PCB-contamination study and removal action; and, to identify, segregate and dispose of drummed wastes. Although work under the Order had begun, the plant closed on November 10, 1989 and work ceased.

OU-2 required the excavation of PCB soils surrounding the polyester loading dock to a cleanup level of 10 parts per million (ppm). Chemical analysis of the soils revealed concentrations up to 3,365 ppm presenting a direct contact risk. The OSC determined a potential for continuing release of PCBs to a process sewer which discharged to Sulfate Basins 4 existed. EPA "Guidance on Remedial Actions for Superfund Sites with PCB Contamination," August 1990, sets forth recommended soil action cleanup levels which range between 10 and 25 ppm for industrial areas. Although future use plans were not specific, the Site was considered a prime industrial area.

1. ROD 2 - Operable Unit 3

OU-3 required the dismantling and demolition of the unstable acid reclaim facility. To the extent practical and necessary, the building and equipment within the

building would be decontaminated using best management practices. Poor maintenance practices and weathering caused the acid reclaim facility to become extremely unstable. The OSC determined that continued degradation of the facility from normal weathering could cause complete collapse. The action addressed the threat of release of hazardous substances including flammable materials.

3. ROD 2 - Operable Unit 4

OU-4 required continued Site security, control, maintenance, and health and safety measures. These requirements were deemed necessary to ensure protection of public health and the environment. The potential for unacceptable direct contact risk to trespassers and cleanup workers existed from the chemical and physical hazards at the Site.

4. ROD 2 - Operable Unit 5

OU-5 required the identification and off-site disposal of nearly 3,000 drums of waste. As a temporary measure EPA staged and overpacked drums which were in poor condition or leaking as part of its removal action. However, the integrity of the drums could be compromised due to continued exposure to freeze/thaw conditions if they remained on the Site. Under these conditions, the drums presented the potential for release of hazardous substances.

C. ROD 3 - Operable Unit 8

EPA signed ROD 3 on September 29, 2000 selecting institutional controls which permanently restrict the land use of Areas B and C to commercial/light industrial. Under a commercial/light industrial exposure scenario, Areas B and C posed no unacceptable human health risk. Although an unacceptable risk was not identified under an industrial exposure scenario, health risks associated with other land uses were not evaluated. Institutional controls were selected to prevent potential unacceptable exposures to human health under other land use, e.g., residential use.

D. ROD 4 - Operable Unit 10

EPA signed ROD 4 on March 2004. The ROD selected in the remedy for Viscose Basins 1 through 8, the New Landfill and Plant Area Soils. Leachate associated with select Viscose Basins contained lead (180 ppb), zinc (58,500 ppb), mercury (7 ppb), and nickel (686 ppb) at concentrations of concern. The wastes in the New Landfill are exposed and pose a direct contact risk to future recreational users and future construction workers. Arsenic concentrations (up to 103 ppm) in the surface materials (0 to 2 feet deep) and adjacent soils pose a potential risk. The Final Ecological Risk Assessment concluded that metals and PCBs pose a potential ecological risks exist at the Site, including VB 1 through 8 and the New Landfill.

The selected remedy for VB 1 through 8 and the New Landfill will protect human health and the environment by capping the waste, treating the leachate which has been in contact with the waste and monitoring ground water Thus, exposure to the waste present in the basins and the landfill and to untreated leachate is prevented. The ROD also includes decontaminating and demolishing the on-site wastewater Treatment Plant (WWTP) when it is no longer required to treat stormwater and leachate.

The final area included in the OU-10 ROD is the Plant Area Soils. During the RI, some soils with elevated lead concentrations (up to 89,700 ppm) that exceed the cleanup standard of 1,000 ppm presenting a risk to future users of the Site were identified. The selected remedial action requires excavation of soils contaminated above defined criteria, stabilization of hazardously characteristic soils due to metals, off-site disposal of all treated and untreated soils with contaminant concentrations which result in exceedances of specified ground water protection standards and all soils containing 50 mg/kg or greater total polychlorinated biphenyls (PCBs), and either on-site disposal or off-site disposal of remaining excavated soils.

On January 10, 2005, EPA issued an Explanation of Significant Differences (ESD) to the March 10, 2004, Operable Unit 10 Record of Decision (OU-10 ROD). The remedy for Plant Area Soils selected in the OU-10 ROD is modified to expand the area of soils to be addressed. The ESD requires response action in an area where potentially contaminated waste and soil have been discovered.

IV. Remedial Actions

Remedy Selection/Remedy Implementation

To date, EPA has signed four RODs as part of a strategy to clean up the Site. In the first operable unit ROD, EPA selected a pump and treat remedy; however, that ROD was suspended and ground water is being addressed comprehensively as part of OU-7. ROD 2, which covers OU-2, OU-3, OU-4 and OU-5, selected response actions needed to stabilize the Site. ROD 3 selected institutional controls that permanently restrict the future land use for two parcels to commercial/light industrial use. ROD 4 selected capping of Viscose Basins 1 through 8, capping of the New Landfill, and excavation of contaminated Plant Area Soils. Depending on the type of contaminate and level of contamination, excavated soils would be disposed off-sited, stabilized and disposed off-site, or disposed on-site. The following discussion examines the progress of remedial activity for each operable unit.

A. ROD 1- Operable Unit 1

In 1982, the Commonwealth of Virginia found carbon disulfide in residential wells located across the Shenandoah River from the Site. Subsequent studies have revealed ground water contamination under and across the Shenandoah River from the Site. Avtex Fibers purchased the properties with contaminated wells in 1983 and 1984. Following the completion of a focused Remedial Investigation/Feasibility Study (RI/FS) by Avtex, EPA selected a pump and treat ground water remedy in September 1988. The remedy addressed contamination

resulting from disposal of viscose waste in viscose basin 9, 10, and 11 on the western portion of the Site. Ground water had become contaminated with carbon disulfide, phenol, sodium, and heavy metals including lead, arsenic, and cadmium. The objective of the remedial action was to reduce the toxicity and mobility of the contaminants in ground water.

In June 1989, EPA issued a UAO to Avtex and FMC requiring the companies to implement the ground water remedial action. Though a work plan to perform the design was submitted, EPA's review of the draft remedial design work plan found that more detailed ground water information with respect to the number of aquifers as well as the lateral and vertical extent of contamination was needed to address ground water.

Due to technical concerns regarding subsurface conditions and extent of contamination, combined with the abrupt shut down of the Avtex plant in 1989, EPA determined that a Site-wide RI/FS was necessary to evaluate the conditions throughout the entire property. Subsequently, EPA discontinued the OU-1 remedial action.

B. ROD 2 - Operable Units 2, 3, 4 and 5

Consistent with the National Contingency Plan (NCP), Section 300.430, EPA determined that cleanup at the Site would be expedited by using a combination of Removal Response authority and Remedial Response authority. As a result, on September 28, 1990, EPA issued the ROD 2 for OU- 2 at the Avtex Site. The actions called for in this ROD were deemed necessary to continue to stabilize the Site. The objectives of this accelerated remedial action were to mitigate potential risks to public health and the environment associated with PCB-contaminated soils, the acid reclaim facility, drummed wastes and possible lack of Site security and control. As mentioned previously, these four discrete remedial actions became OU-2, OU-3, OU-4 and OU-5.

1. ROD 2 - Operable Unit 2

The remedy selected in ROD 2 called for the excavation, transportation, and disposal of an estimated 5,000 cubic yards of PCB-contaminated soils in an off-site approved chemical waste landfill. A cleanup level of 10 ppm was established for this action. The remedial action objective was to prevent direct contact with PCB-contaminated soil and potential migration of PCBs into the environment.

The Region used a removal contractor to expedite this remedial action. A delivery order was issued to the contractor on March 4, 1991. Following completion of a sampling plan, soil excavations were initiated. The initial soil excavation was limited to an area surrounding a concrete loading dock. Located adjacent to the polymer building, the loading dock supported equipment (heat exchanger, oil reservoirs and associated piping) that used PCB-containing fluids. As the excavation of the soil progressed, the concrete loading dock was removed in order to address the underlying soils. A map showing the location of the PCB excavation area is provided as Attachment 1.

Following removal of the contaminated soils and debris, the excavated area was resampled to ensure that the 10 ppm cleanup level was achieved. All soil and debris was transported via railcar to the U.S. Pollution Control Inc.'s permitted Grassy Mountain facility in Utah. The project was completed on January 22, 1992.

Although the project was completed and the cleanup standard met, a PCB-containing oily seepage was observed emanating from underneath the adjacent polymer building. Having revealed the possibility of a PCB source underneath the building, EPA determined that a more thorough study was needed to identify and characterize the source of the PCB contamination. This investigation was performed by FMC under a Administrative Order on Consent as part of the OU-10 RI/FS. In conjunction with this investigation, FMC resampled soils in the PCB excavation area. Six surface and 2 subsurface samples were collected from the excavated area and analyzed for PCBs. PCBs were detected in 4 samples at concentrations ranging from 0.24 - 5.8 ppm. Additional investigations in this area were conducted as part of the NTCRA - Buildings sampling program for soils adjacent to and beneath foundations and subgrade structures. Five surface soil samples (0 to 2 feet) collected from the vicinity of the excavation identified PCBs ranging from 0.093 to 3.1 ppm. After demolition of the building foundation, a surface soil sample (0 to 2 feet) and a subsurface soil sample (2 to 4 feet) collected from soils that had underlain the eastern end of the building identified PCBs at 9.4 ppm and 4.1 ppm, respectively. Deeper subsurface soil samples all contained less than 0.5 ppm PCBs. These data further confirm that the removal was complete.

Institutional controls consisting of land use restrictions limiting land use to light industrial/commercial activities have been implemented through the December 1999 Conservation Easement and can be enforced by EPA, FMC, the Lord Fairfax Soil and Water Conservation District, and the Valley Conservation Council. The 10 ppm PCB cleanup level is protective for light industrial/commercial land use.

2. ROD 2 - Operable Unit 3

EPA determined that dismantling and demolishing the structurally deteriorated acid reclaim facility was necessary to prevent a significant release of hazardous substances. The remedy provided for the dismantling and demolition of the unstable acid reclaim facility, decontaminating the building and equipment to the extent practicable and necessary, and off-site disposal of generated solid wastes. Upon completion, the dismantled building components and equipment would be available for the Bankruptcy Trustee to liquidate. The objective of this action was to reduce the safety hazards present and reduce the threat of release of hazardous substances posed by the deteriorated acid reclaim facility.

The Region used a removal contractor to expedite this remedial action. The action ,which began in March 1991, was completed on September 23, 1993. A pre-demolition report was prepared that provided a detailed inventory of the acid reclaim

facility, a health and safety assessment, and a demolition strategy to eliminate potential structural impacts to adjacent structures. In addition, an asbestos abatement work plan was prepared to address the removal of all asbestos-containing materials (ACM).

Asbestos abatement was the first field task initiated. A total of 3,573 bags of asbestos-containing materials were removed from the building and transported off-site for disposal. Subsequently, all chemical debris was removed from the floors, tanks, and process lines of the acid reclaim facility. The majority of the debris was removed using an industrial vacuum and supplemented with manual removal. An approved QA/QC plan governed the sampling of the chemical debris generated during the project. A total of 416 cubic yards of hazardous waste and 478 cubic yards of non-hazardous waste were transported off-site for appropriate disposal.

Dismantling of the acid reclaim facility began upon completion of the ACM and gross chemical debris removal. The demolition of the main structure progressed from the top down. All outer walls were removed first. At the same time, workers on the inside of the building cut pipes, beams, grating, motor mounts, etc. so that work could proceed smoothly. Concrete flooring, foundation, and brick walls were removed using a wrecking ball. All equipment, tanks, piping and debris was hauled to the boneyard (an area on Site where obsolete equipment was historically placed).

Through the Bankruptcy Court, the Trustee sold equipment and other assets to an outside company. Once the dismantling/demolition project was completed, EPA reviewed work plans to remove equipment and assets from throughout the plant. These materials were removed from the Site for reuse, recycling, and/or scrapping. A significant portion of the assets removed from the Site came from the former acid reclaim facility. Any remaining scrap and debris from the acid reclaim demolition was removed by FMC in accordance with the terms of the Consent Decree. Since all wastes associated with this project were removed through this remedial action, no further evaluation of the implementation and protectiveness of this remedy is warranted.

3. ROD 2 - Operable Unit 4

ROD 2 included a provision for Site security, control, maintenance, and health and safety measures to ensure protection of human health and the environment. The objective was to prevent public access to the Site due to the chemical and physical hazards which still existed and to monitor the Site to ensure that continued deterioration did not result in a release of hazardous substances. Health and safety functions would be implemented to assure worker and visitor protection.

At the time ROD 2 was issued, the Bankruptcy Trustee and EPA had reached an agreement whereby the Bankruptcy Trustee would continue to provide Site security, maintenance, control, and health and safety measures until money was no longer available.

On July 1, 1992, EPA assumed the responsibility for Site security, control and health and safety functions. An EPA-approved remedial action work plan was implemented as described below. EPA through its contractors provided a Site manager and a security team. The onsite manager established and implemented Site access and control procedures. Standard operating procedures for day-to-day activities were developed in order to protect workers and other people accessing the Site from chemical and physical hazards present and to minimize vandalism. The onsite manager conducted coordination meetings with various parties working onsite and oversaw the security guard activities. In addition, the onsite manager would regularly monitor the Site conditions which included inspecting buildings, sewers, WWTP operations for abnormal conditions, potential releases and structural changes.

Site security services were entirely performed by a security guard subcontractor. The subcontractor's primary goals were to safeguard material and personnel working at the Site. A variety of security firms performed security functions between 1992 and September 1999. Security guard service was provided seven days a week, 24 hours per day, including holidays with two guards per shift. These guards patrolled the Site hourly and maintained a log book of all observances. Perimeter fencing and warning signs were checked daily to ensure they were secure and intact. Unusual conditions and observations were reported to the onsite manager for follow-up. In addition, the security guards maintained a daily log of all persons entering the Site and detained Site trespassers.

During the time period the Bankruptcy Trustee owned the property, the Site maintenance of the grounds and buildings to the east of the railroad tracks was the responsibility of the Bankruptcy Trustee. Over time EPA's onsite manager identified unsafe conditions within the building complex. Access to those areas of the buildings where structural, chemical, physical, or other hazards existed was restricted. Flooded areas were pumped out as necessary.

Other maintenance items included grass cutting and snow removal. Once the Bankruptcy Trustee was no longer able to provide these services, a variety of groups maintained the grass cutting activities prior to FMC assuming this responsibility.

Property on the west side of the railroad was occupied by FMC contractors (ERM, EnviroClean, and ERM C&O) operating the wastewater treatment plant. Maintenance of the west side was performed by FMC contractors.

4. ROD 2 - Operable Unit 5

ROD 2 called for the identification, transportation and disposal of 2,879 drums of waste that had been collected from throughout the Site. Drums containing non-hazardous substances would be left on Site and available for liquidation by the Bankruptcy Trustee upon EPA's approval. The objective of this operable unit was to eliminate the threat of release of hazardous substances in drums.

The Region used a removal contractor to implement this action. Various activities, which began in August 1993, were performed to complete off-site transportation and disposal of drummed hazardous materials found at the Site. Initial field activities consisted of sampling, field screening analysis, determining hazard category, compatibility testing, and outside laboratory analysis. Secondary activities consisted of consolidating and bulking of wastes, over packing and lab-packing of the various waste streams, or onsite treatment if appropriate. The consolidated wastes were manifested and transported off-site for appropriate disposal. Empty drums were transported off-site for recycling. All equipment utilized during the drum operations was decontaminated. This remedial action was completed in September 1994. Since all wastes were removed through this remedial action, no further evaluation of the implementation and protectiveness of this remedy is warranted.

C. ROD 3 - Operable Unit 8

The OU-8 ROD was signed on September 29, 2000. The ROD called for institutional controls which permanently restrict the land use of Areas B and C to commercial/light industrial. Although an unacceptable risk was not identified under an industrial exposure scenario, health risks associated with other land uses were not evaluated. Institutional controls were selected to prevent potential unacceptable exposures to human health under other land use, e.g., residential use. The requirements of this ROD are being implemented through the December 1999 Conservation Easement. The Lord Fairfax Soil and Water Conservation District and the Valley Conservation Council hold the Conservation Easement and can enforce its requirements.

D. ROD 4 - Operable Unit 10

In March 2004, EPA selected a remedial action cleanup plan for Viscose Basins 1 through 8, the on-site landfill (New Landfill) and the Plant Area Soils in the ROD for Operable Unit 10. The OU-10 ROD calls for capping the viscose basins and the on-site landfill, treating leachate and monitoring groundwater. In addition, the existing on-site WWTP, which may be used to treat the leachate, will be decontaminated and demolished when it is no longer required to treat stormwater and leachate. The detailed technical plans to implement this portion of the cleanup plan were approved in January 2008 with field work expected to begin this spring. The ROD also calls for the excavation of those Plant Area Soils that contain contaminants at levels that exceed the cleanup standards for the protection of human health and the protection of groundwater and provides for appropriate treatment or disposal of that soil. In January 2006 EPA issued an Explanation of Significant Differences to expand the area being addressed as Plant Area Soils to include additional areas of concern that had been identified. The detailed technical plans to implement the cleanup of Plant Area Soils were completed in September 2006. The Plant Area Soils cleanup is underway and is approximately 75% completed.

Other Response Actions

In addition to the remedial actions called for the in the three RODs issued for the Site, a number of removal response action are being performed. These are described below:

A. Time-Critical Removal Actions - Buildings

EPA's remedial program performed a building investigation and evaluation in 1994 and 1996. It found that areas of the facility had high chemical hazard (large amount of remaining chemical, leaking pipes, vessels) and poor structural integrity. Some areas of the facility had collapsed or were collapsing into areas where hazardous substances remained. Significant structural decay was noted due to corrosion, freeze-thaw cycles and weathering processes.

Based on these findings EPA undertook a time-critical removal action to demolish manufacturing buildings. This action, eliminated approximately 17 acres of building structures, generated over 100,000 cubic yards of debris and waste materials and 5,720,000 gallons of wastewater. In September 1998, as part of a global settlement with EPA, FMC assumed the responsibility to manage the demolition debris and waste materials. FMC began managing the waste in accordance with an EPA-approved plan in October 1999. Since that time, approximately 85,893 tons of waste have been taken off-site for disposal, which included about 14,755 tons of asbestos containing material bulk waste and about 6,884 tons of fine fraction debris with asbestos. Approximately 9,207 tons of scrap metal have been taken off-site for recycling. Demolition debris was screened, decontaminated, stockpiled and sampled. Approximately 20,487 cubic yards of concrete and other inert or exempt debris have been processed and cleaned for unrestricted reuse onsite and approximately 18,361 cubic yards were beneficially reused as fill in the closure of basins. Approximately 6,655 cubic yards of fine fraction material were determined to be characteristically hazardous for lead. Approximately 1,340 cubic yards of this fine fraction material was disposed off-site due to the presence of asbestos. On-site treatment by stabilization was performed on the remaining 5,315 cubic yards of the fine fraction material and was successful for 3,275 cubic yards. The remaining 2,040 cubic yards could not be stabilized to meet the treatment standards and was taken off-site for disposal.

EPA provided conditional approval of FMC's Time-Critical Removal Action Buildings Report dated September 28, 2006. This Report documents the work activities conducted and completed in accordance with Paragraph 21 of the October 21, 1999 Consent Decree describes the work to be conducted and completed by FMC for the Removal Action – Buildings (Time-Critical). Conditional approval was provided because a number of the required activities described by these documents are currently being implemented along with the Non-Time-Critical Removal Action - Buildings as part of the remaining buildings and the remaining sewers remedies, and the Record of Decision for Operable Unit 10 as part of the Plant Area Soils remedy.

B. Non-Time-Critical Removal Action - Basins

The "basins" area consists of the wastewater treatment plant basins (about 4 acres in area) that consist of the emergency lagoon and two polishing basins; the fly ash basins area consisting of fly ash basins 1, 2 and 3 and the fly ash stockpile (about 38 acres) and the sulfate basins area consisting of fly ash basins 1, 2, 3, 4, 4E and 5 (about 80 acres in area). The Ecological Risk Assessment completed by EPA in February 1999 identified an elevated level of risk to ecological receptors from arsenic, cadmium, chromium, copper, lead, zinc and pyrene in the basins. These contaminants exceeded toxicity screening levels in surface water and/or sediments. FMC completed an Engineering Evaluation/Cost Analysis (EE/CA) in May 1999 which identified the options for closing these approximately 120 acres of basins containing zinc sludges or fly ash wastes.

EPA signed an Action Memorandum on January 31, 2000 for the closure of the basins. The goal of this removal action is to mitigate current and potential future risk to ecological receptors from direct contact with uncovered waste in the basins and to mitigate the release of contaminants which may be potentially affecting the ecological receptors in the South Fork Shenandoah River. The cleanup plan calls for the consolidation of wastes on site and provides for closure of the basins containing wastes using protective caps. FMC began implementing this closure project in May 2001 following approval of the Response Action Plan in April 2001. The cleanup activities are facilitating the implementation of the Conservancy Park Master Plan that was developed for the future use of this portion of the Site. The conservancy park concept has been integrated into the cleanup activities, i.e, by revegetating the cleanup areas with appropriate vegetation, construction of a pond and wetland area, and providing the frame work for future park trails.

Under the clean up plan, the wastewater treatment plant basins and sulfate basin 5 will be clean closed. Water covering these basins will be treated in the wastewater treatment plant and sludge will be excavated and placed in sulfate basins 1, 3, and 4. Sulfate basin 5 will become a constructed wetland pond, and the wastewater treatment plant basins will be backfilled and vegetated.

Closure of sulfate basins 1, 3, 4, and 4E will consist of the construction of an "enhanced" soil cover. Installing the "enhanced" soil cover includes using geotextile fabric to increase the stability of the sludge where needed, using fly ash as fill to create grades that promote drainage of precipitation, placing drains within in the cover as needed to facilitate water drainage, placing a geomembrane to achieve the cover permeability criterion, and placing a minimum of two feet of clean soil with vegetation over the geomembrane. In sulfate basin 2, either an "enhanced" soil cover will be installed, or the sludge will be excavated and a 2-foot soil cover will be constructed.

A two-foot thick vegetated soil cover will be placed over the fly ash basins and the area of the former fly ash stockpile.

After completion of construction, the basins will be monitored and post-closure maintenance will be performed to ensure the cap remains protective. Ground water monitoring will be conducted to identify potential future impacts of the basins on ground water quality. The Conservation Easement is in place to prevent disturbance of the soil covers.

To date, sulfate basin 5 has been clean closed, and most of the sludge from the wastewater treatment plant basins and sulfate basin 2 has been consolidated in other basins. Closure of sulfate basins 3 and 4 is in progress and closure of the southern portion of sulfate basin 1 has been initiated. The soil cover for the four fly ash basins has been installed. Fly ash has been excavated from most of the fly ash stockpile and has been stored near the sulfate basins in which it will be used as fill. Areas of incomplete fly ash excavation have been covered with a 2-foot soil cover.

Approximately 75% of the Sulfate Basins, 95% of the Fly Ash Basin and Fly Ash Stockpile, and 30% of the WWTP closures have been completed. The remaining Sulfate Basins and the WWTP basins are needed for stormwater management and treatment, therefore, for the most part, the remaining work will be undertaken when the other areas of the Site have been cleaned up and stormwater collection and treatment is no longer necessary.

Most recently, EPA and FMC have been working through issues and concerns related to areas of poor vegetation growth on some of the basins in which the covers have been constructed. In Spring 2007, some areas of poor growth were replanted, with mixed success. In February 2008, FMC collected field measurements and soil samples for analysis by an agronomy lab to determine the cause of the poor growth. Revegetation efforts will continue after these data have been evaluated.

C. Non-Time-Critical Removal Action - Buildings and Sewers

In accordance with the Consent Decree, FMC completed an EE/CA in June 2001. The EE/CA considered removal action alternatives to mitigate the uncontrolled release of hazardous substances from the buildings and sewers, mitigate cross-media transfer of contaminants and mitigate the potential threats posed by hazardous substances present under building foundations, floors, and subgrade structures. Sampling results confirmed hydrocarbon contamination in the form of oil-stained concrete and oily liquids in sumps and pits was pervasive. PCBs associated with the hydrocarbon stained surfaces and liquids were detected in some locations. Particulate residues (dust and fine debris) containing antimony, arsenic, lead, and benzo(a)pyrene were also found in various locations within the buildings. In addition, chemical residues in the form of caustic salts or acid salts were present in certain locations.

EPA selected a non-time-critical response action to decontaminate the remaining buildings and excavate the remaining sewers on December 20, 2001. The action consists of the removal of hazardous substances located in the remaining onsite buildings including associated foundations, basements, tunnels and sumps as well as the excavation of the sewer systems associated with the plant. EPA approved the response action plan to implement this action in January 2002. Building decontamination has been on-going since January 2002 and it has been

approximately 95% completed, with some subgrade foundations and structures remaining to be managed. Excavation of the sewers began in June 2005 and has been conducted in phases as buildings and other obstacles to sewer excavation have been removed. Sewer removal is ongoing and is about 50% completed, with more than 27,000 feet of sewers having been excavated to date.

D. Wastewater Treatment

In February 1990, EPA issued a UAO to FMC for implementation of the WWTP work plan, including the operation and maintenance of the WWTP and ensuring the effluent limitations and monitoring requirements were met. Today, FMC continues to treat wastewater generated at the Site pursuant to the terms specified in the 1999 Consent Decree which superceded the UAO. The WWTP sand filtration and carbon adsorption units were upgraded during the winter of 2007/2008 due to aging of the previous units. As part of the remedy selected for OU-10, the WWTP will be decontaminated and demolished. As various response actions are completed, the quantity of storm water and leachate requiring treatment will be reduced significantly. When EPA determines that the existing WWTP is no longer needed, it shall be taken out of service, decontaminated and demolished.

E. Non-CERCLA Response Actions

In the Fall 2007, the U.S. Army Corps of Engineers (USACE) completed removing asbestos, demolishing the remaining onsite buildings, and excavating the building foundations and structures, which FMC had decontaminated. This work was performed to prepare the Site for reuse. Future plans for this portion of the Site include a new business park. Towards that end, the United States Congress initially made $12 million available to the USACE to remove the asbestos and demolish the remaining buildings. USACE funding ultimately totaled $23 million with congressional appropriations for this project spearheaded by Virginia Senator John Warner and Congressman Frank Wolf (R-10th District). The USACE implemented a four phase project which included: site planning, asbestos abatement, buildings demolition and debris removal and recycling. The USACE began abating asbestos in September 2001. Building demolition began in August 2002. A milestone of the USACE's project was the implosion of the former boiler house, the largest remaining structure at the Avtex site, on September 19, 2005. The milestone was marked with a well-attended ceremony including Congressman Frank Wolf, EPA Region 3 Administrator Don Welsh, the Army Corps of Engineers, FMC, VDEQ, and representatives from state and local government and community. Once the implosion was complete the remaining debris was managed, the final buildings were removed such as the Power House and Compressor Room, concrete slabs, foundations, basements and utility trenches were dug up, and stone materials were crushed for reuse on Site.

During these activities, approximately 17,700 cubic yards of asbestos and asbestos-contaminated materials, about 150 55-gallon drums of other contaminated materials were taken off-site for disposal, and approximately 550 truckloads of loose equipment and miscellaneous debris were transported to off-site landfills for disposal. As a result of the USACE demolition

work, 780 truckloads of steel and other metals were recycled and 12,000 gallons of recovered oil were sent to a recycler. The USACE activities also resulted in 70,000 cubic yards of crushed concrete and brick that could be used on-site for beneficial or unrestricted reuse.

Operation and Maintenance

There is no equipment or systems associated with the remedial actions work that has been performed onsite. Therefore, none of the remedial actions are in the operation and maintenance stage. However, there are activities associated with other response actions being performed that are essentially as if they were in operation and maintenance, e.g, ground water monitoring..

Operation of the WWTP continues in order to treat water that collects in the remaining open sulfate basins and WWTP basins. This water is primarily stormwater runoff from the Site. In addition, leachate from Viscose Basins 9, 10 and 11 is collected and undergoes biological treatment in the WWTP area. The treated leachate is then discharged into the former WWTP polishing basins for treatment in the WWTP.

V. Progress Since the Last Five-Year Review

As previously mentioned, this is the third five-year review for the Site. The second five-year review completed on March 28, 2003, stated that the remedy for OU-2 was protective in the short-term because the cleanup level of 10 ppm was achieved in the area of concern. In addition, that five-year review found that the remedial action for OU-8, permanently restricting land use of Area B and C to commercial/light industrial use, is protective of human health and the environment. The land use restrictions are being implemented through the Conservation Easement and can be enforced by EPA, FMC, the Lord Fairfax Soil and Water Conservation District and the Valley Conservation Council. These remedies remain protective of human health and the environment as intended by their RODs.

Below is a table from the second five-year review that identifies an issue regarding the OU-2 PCB excavation area.

Table - Issues and Recommendations from Second Five-Year Review

Issue	Recommendation	Party Responsible	Oversight Agency	Milestone Date	Affects Current Protectiveness Y/N	Affects Future Protectiveness Y/N
Ponding of water in the PCB excavation area	Regrade area to eliminate ponding of water. Implement as part of the OU-10 soils cleanup plan to be selected in an upcoming ROD.	FMC	EPA	Signed OU-10 ROD which includes soils by July 2003	N	N

EPA signed the ROD for OU-10 which selected a remedy for Plant Area Soils on March 10, 2004. The PCB excavation area is part of Plant Area Soils. The selected remedy for Plant Area Soils includes post excavation work to backfill and/or grade excavated areas to prevent ponding of water and to establish stable vegetation to prevent erosion. The detailed technical plans to implement the cleanup of Plant Area Soils were completed in September 2006. The Plant Area Soils cleanup is underway and is approximately 75% completed. Once the excavation of impacted soils in the Plant Area is complete, the area will be regraded and seeded. The Plant Area Soils remedial action including post excavation work is anticipated to be completed by Spring 2010. In the meantime, water in the area is managed as it accumulates. Water is pumped to the storm sewer which takes water to the WWTP for storage and treatment. This process has been and will continue to be effective until final grading is completed.

The first five-year review, completed on November 18, 1996, recommended that EPA consider a non-time-critical-removal action for the disposal basins situated along the river. In February 1999, EPA completed a Final Ecological Risk Assessment for the Site and the adjacent reach of the River which established a potential risk to ecological receptors attributed to the surface water and/or sediments associated with fly ash waste and sulfate sludge waste basins. With EPA oversight, FMC is conducting a non-time-critical removal action to close those waste disposal areas. As discussed as part of Other Response Actions in Section IV., above, closure of the basins along the river which include Sulfate Basins and the WWTP basins are approximately 75% and 30% complete, respectively. The remaining Sulfate Basins and the WWTP basins are needed for stormwater management and treatment; therefore, for the most part, the remaining work will be undertaken when the other areas of the Site have been cleaned up and stormwater collection and treatment is no longer necessary.

VI. Five Year Review Process and Findings

Site Inspection

The purpose of the site visit is to gather information about the current status of the site and to visually confirm and document the conditions of the remedy, the site and the surrounding area. Due to work on-going at the Avtex Site, the EPA Project Manager conducts 10 to 12 site visits per year. In addition, EPA has an oversight contractor present at the Site Monday through Friday each week. On January 23, 2008, the EPA RPM and representatives from EPA's oversight contractor, Gannett Fleming and TetraTech NUS, conducted the required site inspection for this five-year review. Areas associated with OU-2 (PCB excavation area) and OU-8 (Areas B and C) were observed, as well as those related to other response activities being performed at the Site. As mentioned previously, there is nothing to inspect onsite with regard to OU-1, OU-3, OU-4, OU-5. Observations from the inspection are provided below.

- Area B remains an open grassy area. Soils in Area B had been excavated for use in the basin closure project. These areas were seeded and grass is reasonably well established. There is an area approximately 100 feet long by 25 feet wide along the north boundary midway between the east and west side showing signs of erosion. There is an area in the southwest corner (approximately 100 feet by 100 feet) used for storing crushed building debris (primarily concrete and brick).
- The former administration building is located on Area B. The building is in use as office space for the EDA. In addition, the Wayside Theater presents regular productions in a large auditorium within the former administration building.
- Area C remains a parking lot.
- There were no signs of oily seepage from the polymer building next to the PCB excavation area. Vegetation was growing in some areas. At the time of the inspection, there was no ponded water observed in the excavation area.
- Phase II sewer work was in progress. Mercury impacted sewer removal was taking place. Preparations were underway for the sewer excavation west of the west haul road scheduled to begin on January 30, 2008.
- Mercury impacted soil from the excavation of sewers was being loaded out for off-site disposal.
- Sampling of NTCRA - Buildings Sewer Soils, OU10 Plant Area Soils, OU10 soil grids at VB 4, 5 and 6 and collecting waste characterization samples was ongoing.
- The WWTP was not operating because there was insufficient stormwater to treat. Treatment had stopped temporarily on January 20, 2008. The treatment system for viscose basin leachate treatment was not operating due to equipment problems; parts were on order.
- Waste piles containing vanadium were being loaded out for off-site disposal.
- The status of revegetation efforts on the cover systems constructed to date for the NTCRA - Basins sulfate basins and fly ash basins, as well as the fly ash stockpile, were viewed. Vegetation remains inadequate in many areas.
- The "SoccerPlex" (former Stump Park area), on which soccer playing fields have been constructed, is now a functioning recreational area.

Community Involvement/Interviews

In February 1999, EPA, VDEQ, FMC and the EDA began sponsoring a multi-stakeholders group (MSG) to facilitate public participation and input into the cleanup and redevelopment of Avtex. The MSG provided an interactive forum where a broad group of interested parties were updated on Site activities and could consider Site-related issues critical to the future of the area. MSG members included local officials, community members, environmental and business group representatives, and municipal planners. The regular MSG meetings provided interested parties an opportunity to raise issues and concerns relative to the Site. In late Fall 2002, the Avtex Redevelopment Advisory Committee (ARAC) was formed. In contrast to the MSG, which was an information tool, the ARAC was intended to be a decision-making group. The ARAC committee included representative(s) from the Town of Front Royal, Warren County, the Friends of the Shenandoah River, and the local community. The overall purpose of the ARAC was to provide a formal mechanism that would allow local citizens to provide input to the town and county on issues relating to the cleanup and redevelopment of the Avtex Site and allow for greater cooperation among and between government entities and citizens. EPA, VDEQ and FMC regularly shared information on the cleanup with the ARAC. Ultimately, the ARAC focused on the redevelopment of the basin area and provided it's recommendations to the EDA. The final ARAC meeting was held on April 5, 2005.

EPA, VDEQ and FMC continue be provide update and information to the community. Consistent with the terms of the Consent Decree, FMC participates significantly in and cooperates with EPA in providing information regarding the remediation and cleanup activities to the public. Each year a variety of methods are used to update the community on progress at the Site which include:

- Mailing a site update in the form of a fact sheet. At least two fact sheet site updates are mailed to nearly two thousand interested parties each year.
- Meeting with key local organizations, including the EDA, the Front Royal Town Council and the Warren County Board of Supervisors.
- Participating in local Festivals and Open Houses (approximately 3 per year).
- Providing updates on Site progress on the local radio station (WFTR).
- Providing site tours to schools and civic organizations upon request.
- Advising media of achievements and milestones, as appropriate.
- Responding to citizen questions and inquiries as they arise.

In addition, FMC developed and maintains a website, www.avtexfibers.com, for those interested in current information regarding the Avtex Site. Moving forward in 2008, FMC anticipates updating the website with the latest information monthly.

Through the methods discussed above, interested parties have indicated they are most concerned with ground water contamination, being able to redevelopment the property, and the length of time it takes to clean up a site. Given the level of community involvement activities on-going at this Site, separate interviews for this five-year review were not conducted.

Document Review

This review included a review of relevant documents. A complete list can be found in Attachment 2.

Data Review

EPA has developed an extensive knowledge base for the Site as a result of multiple actions which have been completed or are underway. In addition, EPA has had a representative from Gannett Fleming/TetraTech onsite practically every day since May 1992. Thus, there has been no new information generated specifically for the purpose of conducting this five-year review.

As reported in the previous five-year review, the OU-2 site-specific cleanup standard of 10 ppm for PCBs was achieved when the action was completed. In addition, as part of its RI/FS activities at the Site, FMC has resampled the PCB excavation area. As mentioned previously, PCBs were detected in four samples at concentrations ranging from 0.24 - 5.8 ppm. This data further confirms that the removal was complete.

With regard to OU-8, the soil concentrations in Areas B and C were determined protective of human health and the environment for continued industrial use. In response to community concern, EPA evaluated the analytical data from the soils associated with OU-8 under a residential scenario in June 2002. The cancer risk associated with Areas B and C were calculated as $1x10^{-5}$ and $2x10^{-5}$ respectively. In addition, the non-cancer risks for both an adult and child calculated for each area yielded a hazard index of 1 or less. Both the cancer and the non-cancer risk associated with Areas B and C do not exceed any risk level of concern and would not present an unacceptable residential risk.

VIII. Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

ROD 2 - Operable Unit Two

The remedy associated with OU-2 was implemented as intended by the decision document. There was no system in operation and thus no O&M activities associated with that remedy.

ROD 3 - Operable Unit Eight

The review of Site-related documents, risk assumptions, and the results of the Site inspection indicate that this remedy is functioning as intended by the ROD. The institutional control for Areas B and C is being implemented through the Conservation Easement. The

Conservation Easement can be enforced by EPA, FMC, the Lord Fairfax Soil and Water Conservation District and the Valley Conservation Council.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

There have been no changes in the Site conditions that would affect the remedial action objectives or the overall protectiveness of the remedy. The OU-2 remedial action was implemented to meet the ROD objectives. In addition, there have been no changes in exposure assessments or toxicity data pertaining to these actions. There have been no newly promulgated standards that call into question the protectiveness of the selected remedy for PCB soils.

Consistent with the previous five-year review, there have been no changes in the Applicable or Relevant and Appropriate Requirements (ARARs) or To Be Considered (TBC) that affect the protectiveness of the OU-2 remedy that was implemented. A cleanup level of 10 ppm was selected for PCBs which was based on EPA's August 1990 "Guidance on Remedial Actions for Superfund Site with PCB Contamination" which recommends cleanup levels between 10 ppm and 25 ppm for industrial sites. This cleanup range remains in use today.

As stated in the previous five-year review, the TSCA Regulations at 40 C.F.R. § 761.61 were cited with regard to the PCB cleanup standard. On June 24, 1999, technical and procedural amendments to TSCA Regulations at 40 C.F.R. § 761.61 for polychlorinated biphenyls (PCBs) were issued. The revisions include cleanup levels that are based on the kind of material and the potential exposure to PCBs left after cleanup is completed. Under these amendments soil is considered a bulk PCB remediation waste and a cleanup level of $\leq$ 25 ppm would be appropriate. This newer standard is less stringent than the cleanup level selected at the time the OU-2 ROD was issued. Since ARARs are frozen at the signing of the ROD, the cleanup standard for the PCB area will remain at 10 ppm, unless EPA issues a decision document which modifies the cleanup standard for that area.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

There has been no other information that calls into question the protectiveness of the remedies selected for Operable Units 2 and 8.

Technical Assessment Summary

According to the information reviewed, the Site inspection, and the community involvement activities conducted, the remedies for OU-2 and OU-8 are functioning as intended by ROD-2 for OU-2 and ROD-3 for OU-8. The OU-10 remedial action is being implemented in accordance with the remedial designs. The other response actions, including the Time-Critical Removal Action Buildings, the Non-Time-Critical Removal Action - Basins, the Non-Time-Critical Removal Action - Buildings and Sewers, and wastewater treatment, are proceeding in accordance with the Consent Decree and applicable Action Memoranda, response action plans,

and response design documents. There have been no changes in the physical conditions at the Site that would affect the protectiveness of the selected remedies and other response actions. In addition, there have been no changes in the risk assessment process or toxicity information used for the contaminants of concern that could affect the protectiveness of the selected remedies and other response actions. There is no other information that calls into question the protectiveness of the selected remedies and other response actions.

VIII. Issues

No new issues have been identified as a result of this technical assessment and five-year review process.

IX. Recommendations and Follow-Up Actions

EPA recommends that five-year reviews continue to be conducted at the Site, since response actions do not allow for unlimited use or unrestricted exposure.

X. Statement on Protectiveness

The remedial action for OU-2 has been completed and the institutional control called for in the ROD for OU-8 is in place. The remedy for OU-2 is protective because the cleanup level of 10 ppm was achieved in the area of concern.

The remedial action for OU-8, permanently restricting land use of Areas B and C to commercial/light industrial use, is protective of human health and the environment. The land use restrictions are being implemented through the Conservation Easement.

In regard to OU-10, construction is in progress for Plant Area Soils and the design for Viscose Basins 1 through 8 and the New Landfill was approved in January 2008. Upon completion the OU-10 remedy is expected to be protective. The other response actions, including the Time-Critical Removal Action Buildings, the Non-Time-Critical Removal Action - Basins, the Non-Time-Critical Removal Action - Buildings and Sewers, and wastewater treatment, are proceeding and are expected to be protective upon completion. The RI/FS for OU-7 is in progress. Future five-year reviews will evaluate the protectiveness of the response actions of those Operable Units, as appropriate.

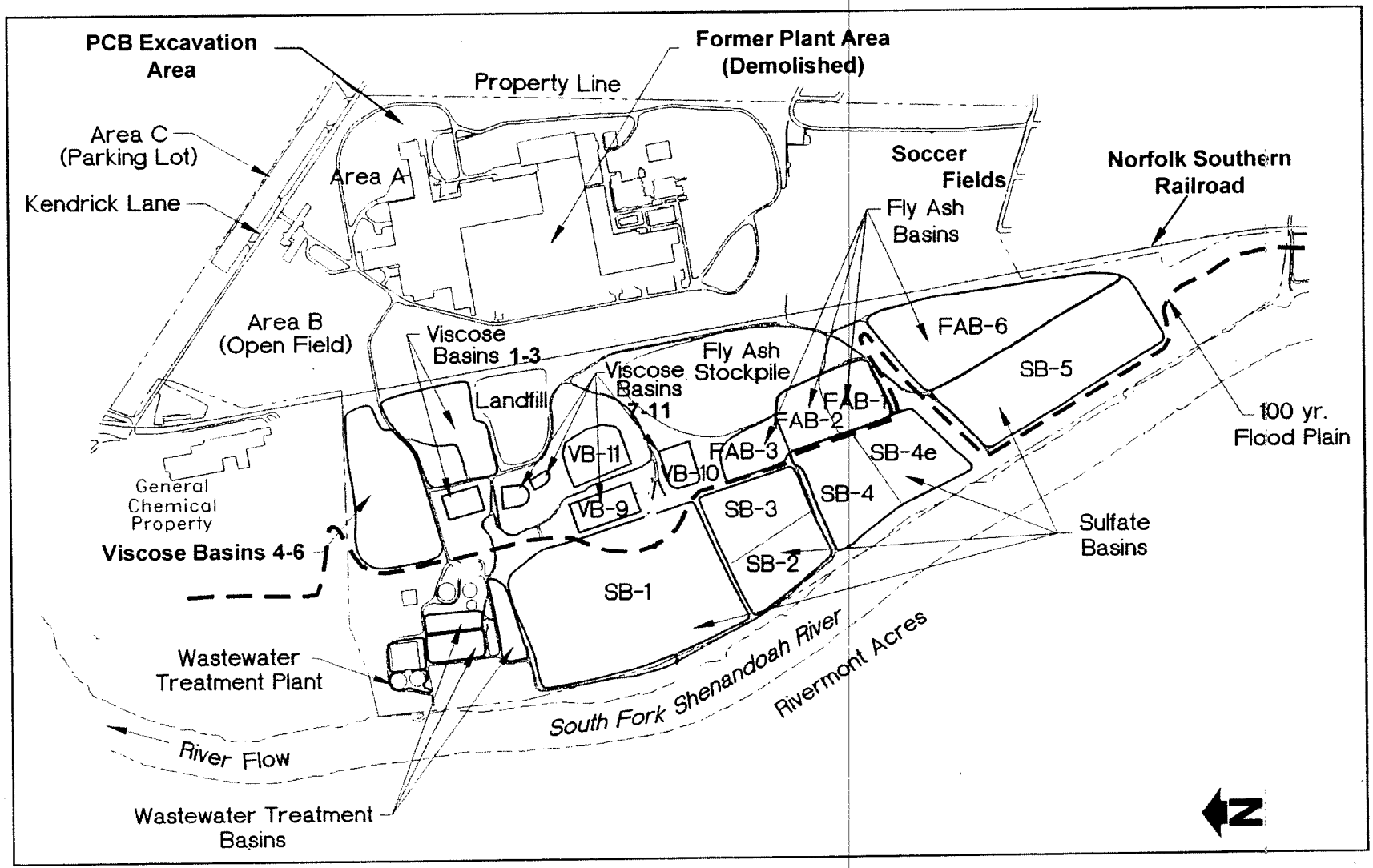
Because the Site is not construction complete, a Site-wide protectiveness determination has not been made.

XI. Next Five-Year Review

Since the remedial actions selected for OU-2 and OU-8 do not allow for unlimited use or unrestricted exposure, the next five-year review for the Avtex Fibers Superfund Site is required by March 2013, five years from the date of this review.

ATTACHMENTS

Attachment 1
Site Map
Avtex Fibers Superfund Site
Front Royal, Virginia



ATTACHMENT 2

Lists of Documents Reviewed

Avtex Fibers Superfund Site Operable Unit One Record of Decision, September 30, 1988, US EPA Region 3.

Avtex Fibers Superfund Site Operable Unit Two Record of Decision, September 28, 1990, US EPA Region 3.

Avtex Fibers Superfund Site Operable Unit Eight Record of Decision, September 29, 2000, US EPA Region 3.

Avtex Fibers Superfund Site Operable Unit Ten Record of Decision, March 10, 2004, US EPA Region 3.

Explanation of Significant Differences, Operable Unit 10 Record of Decision, Avtex Fibers Superfund Site, January 10, 2006.

Final Ecological Risk Assessment, Avtex Fibers Site, February 1999, US EPA Environmental Response Team Center.

Remedial Action Report for Operable Unit Three for the Avtex Fibers Superfund Site, March 31, 1997, EPA Region 3.

Remedial Action Report for Operable Unit Four for the Avtex Fibers Superfund Site, September 30, 2002, EPA Region 3

Remedial Action Report for Operable Unit Five for the Avtex Fibers Superfund Site, March 31, 1997, EPA Region 3

Five-Year Review Report, Avtex Fibers Superfund Site, November 18, 1996, EPA Region 3

On-Scene Coordinator's Report for the Avtex Fibers Superfund Site Removal Action, November 1989 through September 1993, EPA Region 3.

After Action Report for the Avtex Fibers Superfund Site, February 1994 to September 1995, EPA Region 3.

Federal On-Scene Coordinator's After Action Report for the Avtex Fibers Superfund Site, September 20, 1996 to September 30, 1998, EPA Region 3.

Request for Ceiling Increase and Change in Scope of Removal Response Activities at the Avtex Fibers NPL Site (Action Memorandum - Basins), January 31, 2000, EPA Region 3

Request for Ceiling Increase and Change in Scope of Removal Response Activities at the Avtex Fibers NPL Site (Action Memorandum - Buildings), December 20, 2001, EPA Region 3

Five-Year Review Report, Avtex Fibers Superfund Site, March 28, 2003, EPA Region 3

Final Report Time-Critical Removal Action - Buildings, September 28, 2006, Environmental Resource Management.

Conservation and Environmental Protection Easement and Declaration of Restrictive Covenants, November 22, 1999, Recorded in Warren County Virgnia Land Records, December 7, 1999.